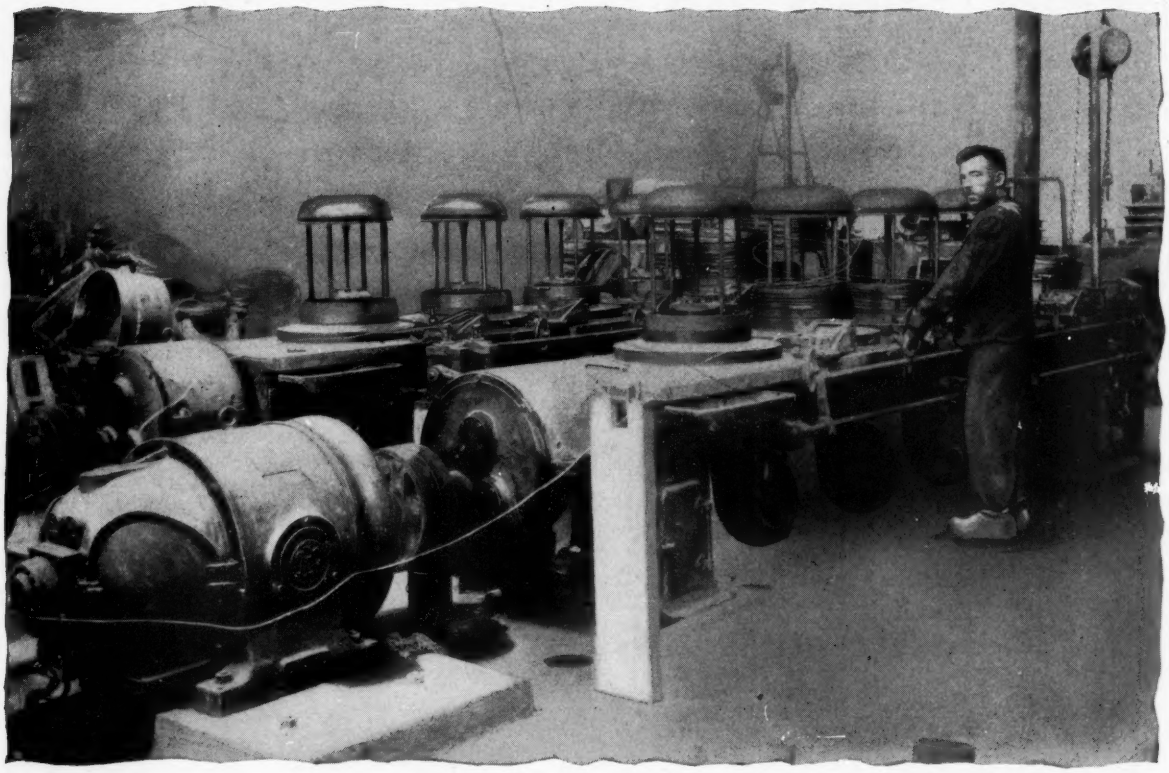
WIRE & WIRE PRODUCTS

Morgan Connor Wire Machines In Europe



In this European mill Morgan Connor Wire Machines have raised production per man hour from 254 pounds to 1154 pounds in 13 ½ gauge.

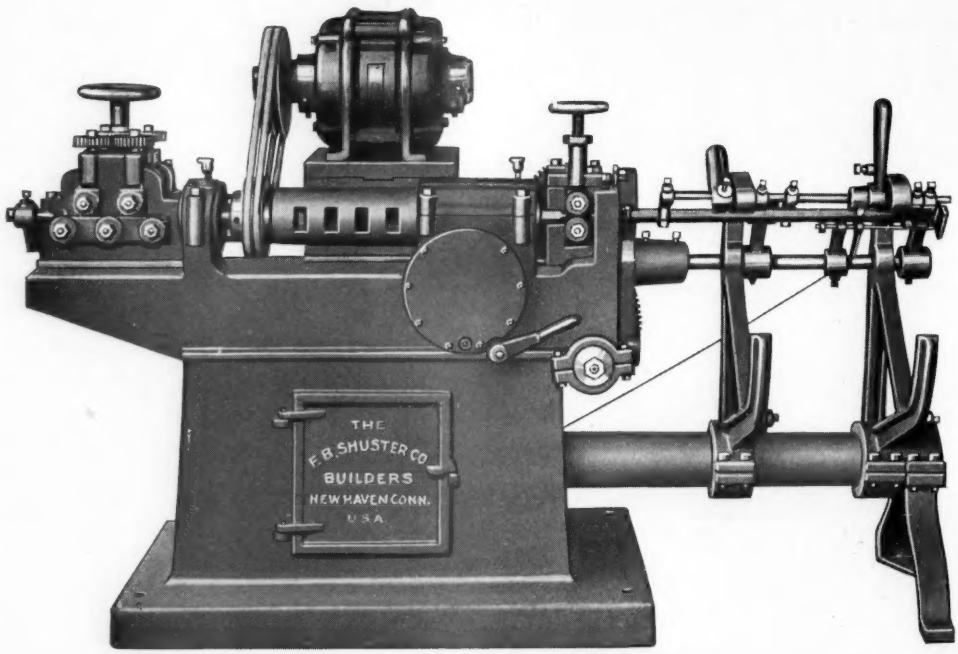
Morgan Construction Company **Worcester, Mass., U. S. A.**

MORGAN
WORCESTER
ENGINEERS AND MANUFACTURERS

February 1929

SHUSTER

Automatic Wire Straightening and Cutting Machinery



WE are showing this month a self contained motor driven Machine, equipped with a five roll straightener which rough straightens the stock before it enters the rotary head, and which is a valuable addition on some kinds of wire.

The straightening head is of steel, and mounted in Timken Roller Bearings—Bearings are bronze bushed, etc.

Makes the wire perfectly straight, at high speed, and cuts absolutely accurate lengths day after day for years, with little attention either for operation or maintenance.

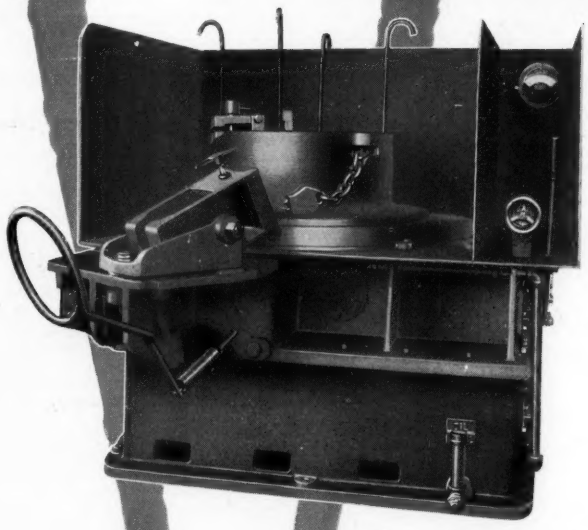
Can we tell you more about it?

The F. B. Shuster Co. **New Haven, Conn.**

Formerly John Adt & Son ***STRAIGHTENER SPECIALISTS*** **Established 1866**

WIRE & WIRE PRODUCTS, Vol. 4, No. II, February, 1929. Publication office, 59 East Washington Ave., Washington, N. J. Executive office, 551 Fifth Avenue, New York, N. Y. Published by the Quinn-Brown Publishing Corp., Richard E. Brown, President; Frank Quinn, Secretary and Treasurer. Subscription price: U. S. and Canada, $5.00 per year, 50 cents per copy; Foreign, $7.50 per year. Entered as second class mail at the Post Office at Washington, N. J., under the Acts of March, 1879, and copyright, 1929, by Quinn-Brown Publishing Corporation.

39 MANUFACTURERS IN 45 PLANTS USE 282 MOTOBLOCS



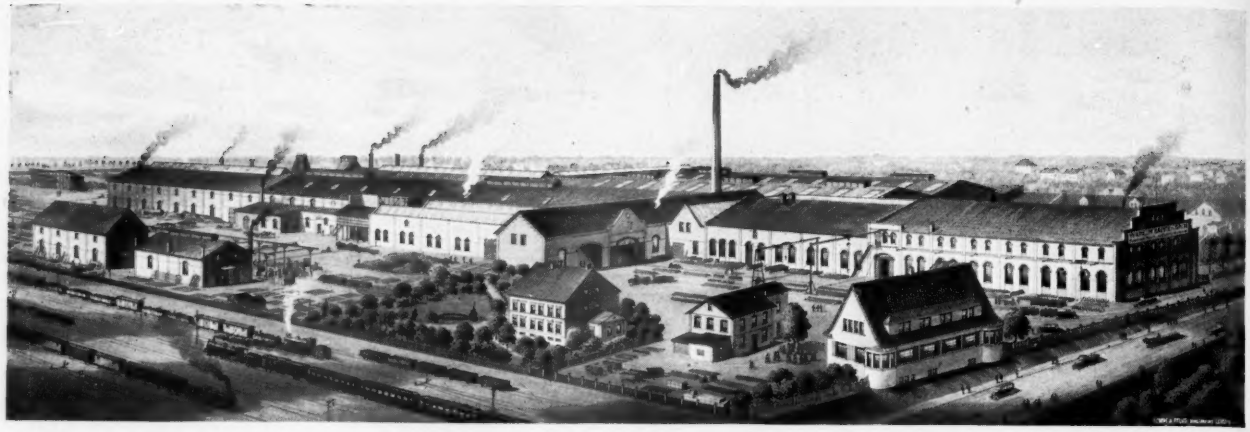
THEY ARE THE PRODUCTION PACE SETTERS OF THE WIRE MILL INDUSTRY

Write for the facts

VAUGHN MACHINERY COMPANY
Cuyahoga Falls, Ohio

EXPORT OFFICE:
420 LEXINGTON AVENUE
NEW YORK CITY

VAUGHN MOTOBLOCS



For the first time, the firm of

WILHELM BREITENBACH

(OF UNNA, WESTFALIA, GERMANY)

offers its products to the American wire industry through this advertising medium. The Breitenbach machines have been for decades installed in most of the leading wire factories of Germany and numerous important plants in all other parts of the European continent.

The firm of Wilhelm Breitenbach, established in 1863, has for 60 years been solely occupied with the construction of wire working machines, and it therefore possesses an unusual experience in this line.

A large equipment of special machines and the fact that the machines are constructed from raw material to finished product right in the shop itself, enables us to quote very low prices and, furthermore, the quality of the machines is unsurpassed.

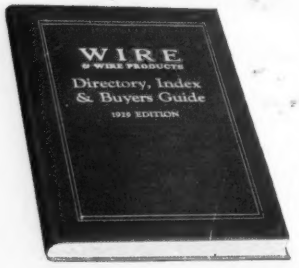
The Various Main Products are the following:

1. **FOR FRICTION, HEAVY AND MEDIUM DRAWING,** of standard as well as special design protected by patent. The special features are the unsurpassed screw spring friction coupling of special design as well as the shaft in ball bearings, patent protected, covered by an oil casing.
2. **FOR FINE DRAWING AND VERY FINE DRAWING** in standard and special designs. The following machines are especially worthy of mention:
   a. For fine drawing and very fine drawing with screw spring friction coupling adapted for special wires.
   b. For fine drawing and very fine drawing with quick disengaging coupling, especially for steel wire.
   c. For very fine drawing with attached winding device, especially for wire rope.
3. **MULTIPLE DRAWING MACHINES** designed especially for iron wire from 2.2 mm up (patented design). Drawing rollers and drawing stones are entirely cooled in the drawing liquid during operation. For iron wire from 2.2 down to 0.8 mm, the output of 1000 kilos per laborer in 8 hours is unexcelled.
4. **WINDING APPARATUS,** with special drive or gear, for steel wire hardening and galvanizing plants. Made for wire of all dimensions.
5. **RAPID WINDERS** for respooling galvanized wires, **WIRE WASHING, WIRE POINTING** machines and similar machinery.

The American wire industry also needs these machines, because they are highly developed in every respect.
Expert representatives who are in close relations with the American wire industry are wanted.

WILHELM BREITENBACH, Unna (Westfalia, Germany)

Machines for Wire Production



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CONTAINS over 13,000 listings, under 800 headings, of manufacturers and supply dealers in wire and wire mill equipment, wire forming machinery and supplies.

¶A handy size shop and desk reference book indispensable to the purchasing executive in wire making, wire forming and associated industries. All orders should be addressed to:

WIRE & WIRE PRODUCTS

551 Fifth Avenue **New York City**

IT is estimated that American manufacturers now spend fifty million dollars each year in industrial research which produces discoveries worth one-half billion dollars.

In a recent address on "The Perils and Profits of Research," Thomas Stockman Baker, President of Carnegie Institute of Technology, made the following observation:

"Far sighted men of affairs must perceive that something more than financial resources is necessary for commercial progress. Modern business demands two kinds of capital, money and technical knowledge.

"Research is a curse and a blessing. It is a curse to those individuals who do not employ it, and who are in competition with those who utilize scientific experience and technical skill. It is a blessing to those enterprises which owe their progress to the methods of the scientist and the skill of the investigator."

Sixty-eight per cent of the eight hundred American manufacturers queried by the National Research Council maintain private laboratories. Twenty-five per cent of these are working toward the development of new fields of application, and twenty-five per cent to discover by-products and new materials.

In view of such enterprise on the part of his most formidable competitors, what a handicap, in the long run, is placed on the small manufacturer, the isolated technical worker, the detail-driven executive whose sun rises and sets on his own premises?

Here is where his trade paper can serve him.

Some forthcoming contributions to *Wire & Wire Products* are reports of significant advances in wire drawing and forming. For most readers they will supply the salient features of such progress in the industry as has resulted from the tried and tested research and experiments of others.

The Publishers

WIRE & WIRE PRODUCTS

A monthly publication devoted to wire drawing and wire forming

Vol. 4 February, 1929 No. 2

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Krupp-Made

Widia Metal and Wallramite Used Exclusively in These Dies

Why is it that European competitors are able to undersell the American wire manufacturer in spite of heavy tariff duties and transportation charges?

HERE ARE A FEW REASONS

Reduced Die Costs

They have succeeded in reducing die costs to a minimum with UN-WIDIA and WALLRAMITE dies, which in Continental practice have replaced the chilled iron, steel, and in the case of hard wire, diamond dies.

Increased Production

Production per machine has been increased from 25% to 35% due to increased drawing speed and continuous drawing with UN-WIDIA and WALLRAMITE dies.

Finer Quality Wire

The wire drawn with these dies is of a much finer quality and is made at a decreased cost.

Longer Die Life

With better quality of wire from the coarse wire machine, the diamond dies last twice as long on size when redrawing fine wire.

Reduced Labor Costs

Labor costs are reduced in direct proportion to increased machine production.

Reduced Manufacturing Costs

Die room costs are cut 75% or more and many of the usual cleaning operations are eliminated by the use of UN-WIDIA and WALLRAMITE dies.

Lower Die Costs

Considering the tonnage of wire drawn, the die cost is actually lower than that of chilled iron and steel dies.

UN-WIDIA and WALLRAMITE dies are manufactured and sold exclusively by the

Union Wire Die Corporation

Manufacturers of diamond and alloy metal dies

333 WEST 52d STREET NEW YORK CITY

WIRE
& WIRE PRODUCTS

Vol. 4 FEBRUARY, 1929 No. 2

Wire Formers Ask Tariff Revision

Congressional committee receives suggestions, protests and recommendations from manufacturers and importers

PRODUCERS of numerous varieties of wire and wire products asked for increases in tariff duties at the January hearings held in Washington by the House Committee on Ways and Means on readjustment of the tariff.

A 65% ad valorem on woven wire of from 40 to 65 mesh was asked by Hamilton Linday of Cleveland, representing the Wire Cloth Manufacturers' Association, and by John F. Curley of Holyoke, Mass., representing the American Wire Weavers Protective Association. The present duty is from 20%, 25% and 30% for the different meshes. Mr. Linday said that low wages in Germany and France are accountable for the flood of imports of woven wire.

Fine Steel and Watch Springs

W. D. Thomas, of New York, representing the American Importers of Fine Steel, said that the tariff should be revised downward on fine steel and semifinished fine steel. European steel cannot compete with the American products in price, he said, and many American manufacturers prefer the foreign steel for certain purposes. Only 2% of the entire consumption of semifinished steel is imported, he said.

Charles A. Ogren, of New York City, representing the Sandrik Watch Spring Company, asked that a duty of 3 cents each be added to the present duty of 45 cents ad valorem on main spring for watches. He complained of importations from Switzerland where he said wage costs are much lower than in the United States. He stated that production in the United States is a new industry.

Pins and Needles

E. F. Kopp, Bloomfield, N. J., spoke for several companies producing safety pins. He said the industry is "in a very bad way" and needs more protection. He told of importations at 11 cents a gross of pins for which he said the lowest domestic production cost is 17.23 cents a gross. He asked that the duty be increased from 35 to 50 per cent ad valorem.

J. M. Roberts, of Washington, D. C., speaking for the Scientific Apparatus Makers Association, asked for more inclusive definitions in the law and readjustment of rates in line with wage differences here and in Europe. He asked for an ad valorem duty (now 40 per cent) of 50 per cent ad valorem.

William Meyer said that the knitting machine needle industry, which he stated was built up in this country during the war, was being pressed severely by competition from abroad. He asked for duties of $2.50 a thousand and 50 per cent ad valorem. He states the domestic production cost as $9.95 a thousand.

The Umbrella Manufacturers Association was represented by Oscar I. Meyers of New York City, who said the industry is in a "most deplorable condition," because, he declared, of an increase of more than 700 per cent in importations. Labor costs abroad, he stated, are only about one-third as much as in this country and they amount here to about 65 per cent of production costs. He asked that a specific duty be added to present ad valorem duties.

Other Revisions Asked

E. M. Deese, on behalf of three manufacturing companies, asked for increased duties on gimlets.

Fred Truempy, a New York importer, said that a Treasury classification had cut off importations of ferro-silicon-aluminum alloy and asked that it be put clearly in paragraph 302 so that it might be brought in.

Recent Advances in Copper Wire Drawing

An electrified plant lay-out that requires fewer passes, reduces production costs and increases output

By Morris A. Hall

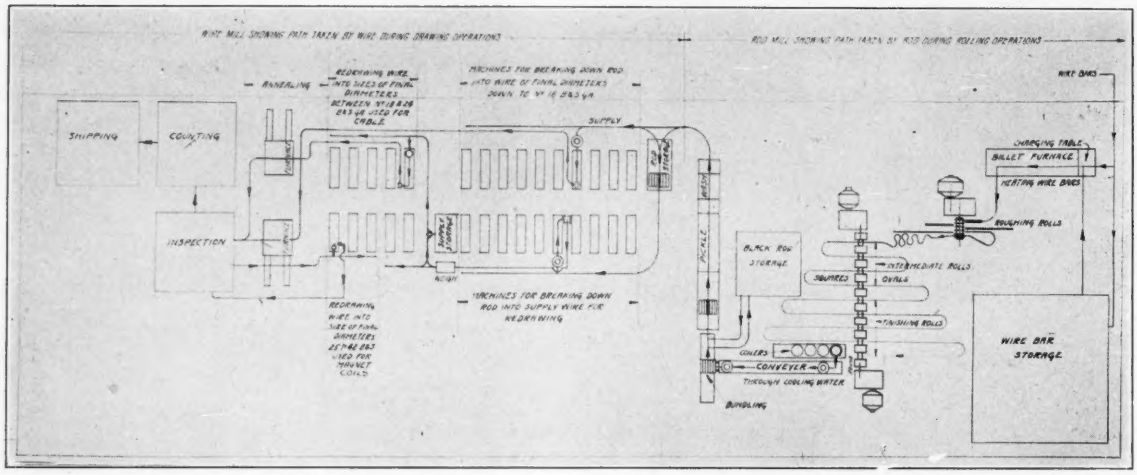

WIRE MILL SHOWING PATH TAKEN BY WIRE DURING DRAWING OPERATIONS
ROD MILL SHOWING PATH TAKEN BY ROD DURING ROLLING OPERATIONS
ANNEALING
REDRAWING WIRE INTO SIZES OF FINAL DIAMETERS BETWEEN 19 AND 26 B&S GA USED FOR CABLE
MACHINES FOR BREAKING DOWN ROD INTO WIRE OF FINAL DIAMETERS DOWN TO 19 OR 26 B&S GA
SUPPLY
SHIPPING
COUNTING
INSPECTION
REDRAWING WIRE INTO SIZES OF FINAL DIAMETERS BETWEEN 22 AND 28 B&S USED FOR MAGNET COILS
MACHINES FOR BREAKING DOWN ROD INTO SUPPLY WIRE FOR REDRAWING
WIRE BARS
CHARGING TABLE
BILLET FURNACE
HEATING WIRE BARS
ROUGHING ROLLS
BLACK ROD STORAGE
INTERMEDIATE ROLLS
SQUARES
OVALS
FINISHING ROLLS
WIRE BAR STORAGE
COILERS
CONVEYER
THROUGH COOLING WATER
BUNDLING

Fig. 1 Schematic layout of Western Electric copper rod and wire mill at Chicago, indicating space saved by high speed compact machines.

DEVELOPMENTS within the wire-drawing industries have not been many but one branch of the wire-using field that has seen a number of forward-looking steps is that of telephone wire. The telephone companies have been seeking more and better wire, and at a lower price. These three qualities have thrown back on the production end a tremendous burden, tremendous because it was three-fold. More wire per machine or per plant would be enough to ask. Or better wire from the same equipment, investment and men, but to add these together, and then tack on lower cost, made the problem a big, involved, difficult one, also one that has been slow in the solving.

One of the larger companies producing its own wire, The Western Electric Co., has solved this to its own satisfaction.

As might have been supposed from the broad demands, the resulting cheaper better wire and more of it comes from a new and, to a large extent, decidedly different plant. This was constructed to take advantage of new ideas rather than follow traditional wire practice. These ideas are four in number:

Four-fold Nature of the Improvements

1. A continuous plant with wire bars or billets in at one end, finished wire out at the other, somewhat like continuous conveyor lines in automobile plants but using overhead monorail handling equipment.

2. Working the metal harder, particularly in the earlier passes.

3. Fewer passes, higher speeds, simpler machinery, use of less floor space.

4. All electrical machinery and equipment in the basement under the wire-drawing machines so that mechanics need no electrical knowledge, separating mechanical and electrical work, despite the plant being wholly electrified.

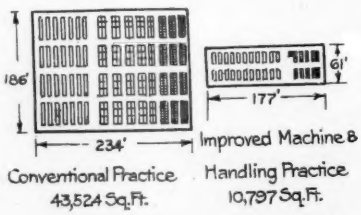


Fig. 2. Diagram of wire drawing plants indicating amount of floor space conserved by improved practice and machines.

The first and last are concerned with buildings, positioning of machinery in them and similar questions. The second and third are purely wire-drawing practice although involving metallurgical and chemical research and pre-testing. They deal with machine design and use, and the features incorporated in the machines to produce newer and better results.

Continuous operation is not so radical in that many plants include working with most of the parts but it is different to the extent that the one building, starting from the wire billet, completes the wire as used by this company. As Fig. 1 shows, rod mill, break-down

mill, re-drawing mill, pickling, washing, annealing, weighing, counting, inspecting and shipping are all under the one roof.

The second item relates to working the metal. It was the opinion of the company's engineers and metallurgists that the hot metal could be worked harder on the early passes. So, instead of the usual 18 rod passes, machinery and equipment were planned for 16. Last-minute improvements permitted the final use of 14. The former plan would have saved 2/18s or 11.1% but the final solution brought a saving of 4/18s or 22.2%. While these great savings were made in the rod mill, there were other and equally desirable economies in the wire mill.

Exploding An Old And Firmly-Held Theory

It has been thought that more passes bettered the physical condition of wire, the theory of the entire wire-drawing industry being that a greater number of passes resulted in a better and stronger wire. The engineers took billets, converted it into ¼ in. wire rod, under exactly similar and parallel conditions, doing the rolling simultaneously, and tested the resultant wire.

Two lots, 18 passes, averaged 37.9% elongation and 32,599 lbs. tensile.

Two lots, 16 passes, averaged 38.55% elongation and 32,314 lbs. tensile.

One lot, 14 passes, showed 42% elongation and 32,391 lbs. tensile.

The average of the five was 39.5% elongation and 32,243 lbs. tensile. The lot with the fewest passes was superior in elongation (42 compared with 39.5) and slightly above the average in tensile strength. If the average of the first four lots were taken as the criterion the superiority of the 14 pass lot would be higher and more apparent.

In addition the number of dies per machine has been increased and machines speeded up.

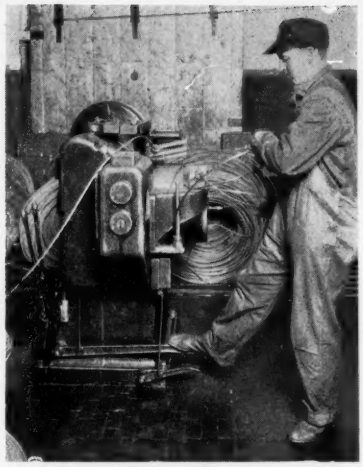


Fig. 3. Heavy wire die stringer used in stringing dies on the larger sizes of wire drawn in the No. 1 machines.

The speeding up, made possible partly by fewer passes, resulted in greater output per unit while the grouping of more dies in each unit on the wire end effected a marked decrease in the sizes of the machines. The output per unit of floor space has become much higher so that it has been possible to produce more wire from less actual space. Despite the added use of the basement, this has brought a large cut in the cost of buildings.

Smaller buildings call for less land, less upkeep cost and effect other economies. As will be shown, a greater quantity of wire has been produced from a wire-drawing plant of one-fourth the normal floor space.

Safety Results from Separation of Electrical Units

Separation of electrical and mechanical units automatically separated electrical and mechanical work and maintenance. The mechanically-inclined wire rollers need know nothing of electricity; they press a button to start a machine, again to stop. Electrical maintenance men work wholly in the basement and need not know nor see anything of the wire-drawing machinery. This separation of the two dissimilar lines of work has minimized interference of electrical workers with production and of wire-drawing operators with electrical equipment, and corresponding accident hazards of both.

Practical wire men will see in the plant layout, construction and operation what has been done and is being done that is different and the extent to which this is better.

Rod-rolling equipment consists of billet-heating furnace, roughing mill, intermediate mill, finishing mill, coilers, pickling tubs, conveyors. Mills are water cooled with down-draft exhaust carrying all fumes to air washers where the copper dust is recovered, an item in sanitation and economy.

Details of Rod Mill Procedure

The 225-lb. bars are unloaded on skids in the train shed and transported by electric truck to the charging end of the heating furnace. A hoist transfers them by sixes to the charging table, a compressed-air pusher moves them through the 120-bar furnace heated by fuel oil. At the opposite end they are withdrawn at 1,600 deg. F by tongs and pushed into the roughing mill. The tongs operate on a trolley from a beam in line with the first groove. The rougher consists of three motor-driven rolls. The bar passes the first groove between top and middle rolls, drops to feed rolls and is returned to the second groove between middle and bottom rolls, then raised to third groove above. In five passes the cross section is reduced to intermediate size from 4 x 4 in. x 54 ft. to oval x 124 ft.

This goes to intermediates, passes the first rolls, operator catches and passes back, repeating until it becomes ¼ in. round x 1,200 ft., then through guide pipe to coiler. Coils are automatically unloaded on the conveyor to the cooling water in a tank under the floor, and 82 seconds after entering the rougher are ready for pickling. Two rods are maintained in the finishing mill, which requires 800 h. p.

Coils are cool enough to handle

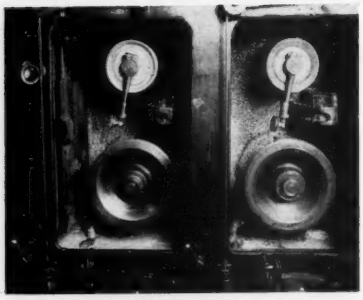


Fig. 4. Detail of two of the units in the No. 3 wire drawing machine. These draw magnet wire down to sizes as small as No. 42 B & S gauge.

when they emerge from the tank, are tied with wire, lifted by monorail crane and placed in pickling tank for 30 mins. They are washed with lake water to remove loose dust and acid, then immersed in an alkaline fat solution to neutralize traces of acid and provide a protective coating until converted into wire. These are carried by mono crane to the wire-drawing machines. Dies on the heavy wire machines are pulled into place at the starting end of the coil or die-stringing machine (Fig. 3). Coil is then placed in the machine. Heavy gages are drawn in one set-up, medium sizes redrawn on intermediate machine, fine (magnet wire) redrawn from intermediate sizes. This is indicated on the layout, Fig. 1.

Capacity Figures Indicate Speed and Economy

The rod mill has a capacity of 70,000,000 lbs. a year on a 48-hr. week basis. Wire-drawing capacity is 42,000,000 lbs. in sizes from .165 line wire down to .00247 (42 B & S) magnet wire. Buildings and foundations provide for expansions which would absorb the difference in rod mill and wire mill capacity.

The No. 1 heavy wire drawing machine draws line wire heavy toll cable and supply wire for loop cable wire machines. It is a 10-die machine, occupies 270 sq. ft. with equipment and operating area and runs at 1,500-2,000 ft. p. m. This compares with 470 sq. ft. for the commercial 9-die machine running at 1,000 ft. p. m. A battery of these costs less than commercial machines of the same capacity and saves floor space. The new 12-die multiple-head intermediate machine (4 unit) occupies 90 sq. ft. against 130 sq. ft. for the commercial 10-die (1 unit) machine. At twice the speed, the former has five times the output, costs less per unit, much less on an output basis.

Details of the Smaller Fine-wire Machine

Magnet wire drawing machines (Fig. 4) are high-speed 12-die multiple head, 8 units, 90 sq. ft. space; commercial, 1 unit of same die capacity, 51 sq. ft. The saving in investment is greater than in heavy and intermediate machines. Compact machines and overhead monorails permitted installing the mill in less than one-fourth the normal commercial floor space, as Fig. 2 shows.

Present connected load is 6,000 h. p. with a 700-ft. tunnel connecting power plant and wire mill, Basement under rod mill houses the electrical equipment, control boards for rougher and

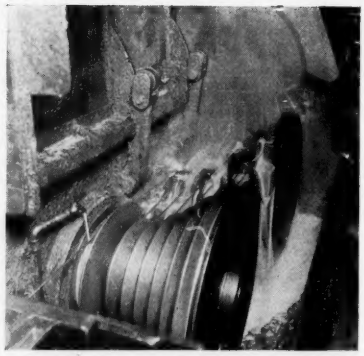


Fig. 5. Detail of the No. 1 wire drawing machine showing flood of lubricant over dies as wire is being drawn.

intermediate, pump for cooling water and exhaust fan air washer. A tunnel under intermediate and finishing mills connects with this and houses the drives for the four rod coilers, coiler control boards, finishing mill controls and main power panel. In the basement of the finishing mill are six tanks for liquids used as lubricants and for cooling dies, supplied under pressure and returned by gravity. All machines are controlled by push buttons to compensators in basement. The large wire-drawing machines are driven by chain from the 100 h. p. motors in the tunnel and are accessible to electricians for maintenance, reducing to a minimum interference with production.

The development of these compact high-speed machines representing several years' effort has required a much smaller investment in land, building and equipment than would be necessary with ordinary commercial machines.

Electric Company Turns Waste Into Profit

BY applying scientific research to the problem of the disposal of thousands of pieces of scrap material, the Western Electric Company, at its Hawthorne Works in Chicago, has been able to turn this waste into a very considerable amount of money—three to five millions of dollars annually.

In the manufacture of the many millions of dollars' worth of new apparatus and equipment, according to the "Edison Monthly," this company is obliged to produce billions of pieces of material yearly, involving the use of some 18,000 different types of raw material from all over the world. Forty-four thousand square feet of floor space are devoted to this work.

This great amount of material is sorted into more than 200 different classifications of scrap. Approximately 25% of the scrap is salvaged to be reused in telephone apparatus. All copper scrap is melted down to be made into wire. Reclaimed lead is used to manufacture new cable sheath or to make solder. All other metal scrap which can be used in the foundry is sent to that department to be made into new parts. Hard rubber is ground up and used to manufacture new parts.

Monel Metal Springs For High Temperatures

Effects of heat on the performance, hardness and strength of rust-proof and corrosion-resistant springs

By G. V. Pickwell

Metallurgist, The Wm. D. Gibson Co., Chicago, Illinois

As a result of the tests here reported, the author concludes that Monel Metal may be recommended for temperatures up to 500 degrees F., and that it is superior in this range to the usual spring bronze. In respect to spring properties (torsional elastic limit) it is about equal to carbon spring steel, but inferior to alloy spring steel, though of course the latter are not corrosion-resistant. Mr. Pickwell's paper is here reprinted from "Inco" through the courtesy of the International Nickel Company.

THE purpose of this article is to formulate from experimental data a guide for the use of springs made of Monel Metal when operating at elevated temperatures. It is also intended to answer some of the following questions often asked the manufacturer of springs:

(1) At what temperatures will springs made of Monel Metal begin to lose their temper?

(2) How much heat or what degrees of temperature will springs made of Monel Metal stand?

(3) How long will springs made of Monel Metal operate under a known condition of load and temperature before they take permanent set?

(4) How much will the "set" be and how can it be predetermined?

These questions and others of a relative nature we have attempted, by means of experimental data, to answer and explain.

The Question of Temper

The question of temper can be answered for Monel Metal the same as for other metals. A metal will not begin to lose its "temper" or hardness until a temperature has been reached which is considerably above the safe operating range for that material.

On the accompanying diagram (Fig. No. 1) it will be noted that Monel Metal spring wire after it has been heated to about 800° Fahr. suffers no appreciable loss in hardness as shown by the Rockwell Hardness test. The working strength of a spring made of this material would be almost entirely lost if operated at that temperature.

The difference between hardness (temper) and strength of Monel Metal after being subjected to elevated temperatures is shown in the same diagram.

Wire Test Specimens

The tests in each case were made upon specimens of .224" diameter round, hard drawn Monel Metal wire suitable for spring manufacture.

Hardness readings were taken upon straight specimens of the material by means of the Rockwell hardness tester. The readings given are those shown on the Red or "B" scale of the dial using the diamond cone and the 150 kgm. weight.

The loss of strength curve was obtained from specimens of the material coiled into helical compression springs. The stress shown was calculated from the actual load in pounds subjected upon the spring using the formula:

$$S = \frac{8}{Pi} \frac{D}{d^3} W$$

in which D=pitch diam.; d=wire diam.; W=load.

In each case the values obtained were taken from the cold specimens after having been subjected to the temperatures shown.

The drop in strength is in reality a measure of the amount of permanent set suffered by the spring when loaded at given temperatures.

The question as to what temperature a spring will stand, or the amount of "set" a spring will take when operating under a given temperature is somewhat analogous to the question of how far a spring will deflect and still retain its entire free length when released, or what load a spring of a given design will support.

Set Varies With Heat

For a given design of spring it is a known fact that the greater the load the greater will be the deflection in some definite relation. In the case of a helical spring this relation is directly proportional. In the case of a spring operating at elevated temperatures the amount of set it will take is proportional but to a varying degree. Up to a certain stress and temperature springs made of Monel Metal take no appreciable set. As soon as this point is exceeded

Load Cold—Load supported after heating to temperatures shown. Pounds per square inch.

Temp.	250o	250o	310o	350o	400o	450o	510o	550o	600o	650o
10,000	10,000	10,000	10,000	10,000	9,700	9,630	9,150	8,350	7,130	6,380
20,000	20,000	20,000	19,900	19,800	19,700	19,300	18,400	16,800	15,410	13,100
30,000	30,000	30,000	30,000	30,000	29,600	29,300	27,900	25,400	23,230	19,600
40,000	40,000	39,800	39,600	39,300	39,200	38,300	35,200	31,200	28,500	23,700
50,000	50,000	50,000	49,400	49,000	48,800	47,400	44,000	39,800	34,500	27,600
60,000	60,000	59,900	59,800	59,000	58,500	57,300	53,500	49,000	43,700	36,800
70,000	70,000	69,500	69,400	68,600	68,400	65,800	60,200	55,200	48,400	40,000
80,000	80,000	78,500	77,700	76,500	75,700	72,800	67,000	62,100	53,000	43,000

Physical Data on Springs—O.D. 1.255, d. .224 P.d. 1.031, S— 233. x W., Rockwell Hardness, B-Scale 58-60, E.L. 54,000 psi., Ult. L. 84,000 psi.

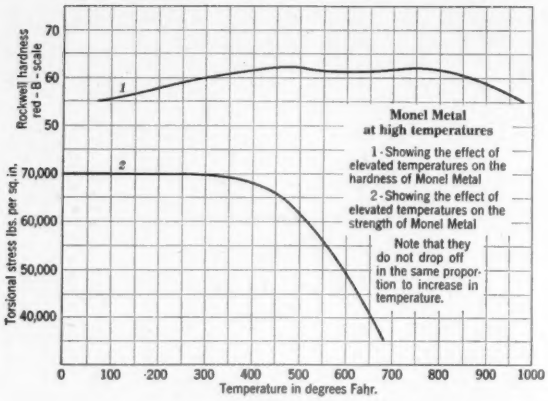

Rockwell hardness red - B - scale
70
60
50
Torsional stress lbs. per sq. in.
70,000
60,000
50,000
40,000
1
2
Monel Metal
at high temperatures
1 - Showing the effect of elevated temperatures on the hardness of Monel Metal
2 - Showing the effect of elevated temperatures on the strength of Monel Metal
Note that they do not drop off in the same proportion to increase in temperature.
0 100 200 300 400 500 600 700 800 900 1000
Temperature in degrees Fahr.

Fig. No. 1

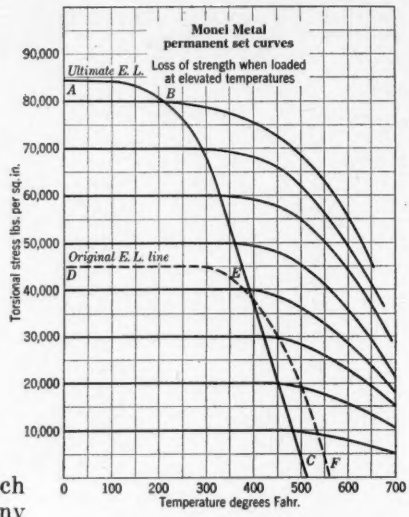


Fig. No. 2

in either stress or temperature, then the load begins to drop of, showing that the spring is losing its original strength.

These values of loss can readily be determined by plotting the results taken from the actual specimens of springs loaded at various stresses and then subjected to a series of gradually increasing temperatures. The higher the stress under which the spring is operating the lower will be the temperature at which it begins to lose its original load. In the accompanying diagram are plotted the results of tests made upon springs which were loaded at stresses varying from 10,000 to 80,000 lb. per sq. inch in steps of 10,000 torsional fibre stress.

From the diagram it will be noted that the area under the heavy line is the range of stresses under which a spring will operate with no loss or set for the corresponding temperatures. To the right of this line the springs gradually begin to lose in strength and as the temperature is increased this loss or "set" becomes more and more rapid until at a temperature of about 650° Fahr. the springs have lost 50% or more of their original loaded strength.

High Temperature Guide

When using Monel Metal under conditions of elevated temperatures, it is advisable to follow the diagram as a guide and it is further advisable to use the springs at a stress sufficiently low that they will not be subject to more than a 5% loss in load at the temperature in which they are to operate. In many cases this would be commercially good practice since the capacity of the spring is subject to a possible 10% load variation in the process of manufacture. If the springs then are designed with a safety factor of 5% to 10% capacity above that under which they are required to operate, the slight loss they will suffer will bring them down to very near the correct load.

Controlling Set

In cases where the capacity is extremely important and it is desirable to suffer no loss on the spring after it has once been assembled and adjusted, it is necessary to remove this initial set in the spring by actually pressing it down under the temperature, or slightly above the temperature at which it is to be used, thereby removing the danger of the spring taking further set after it is assembled. It is found that this can be done if the chart is followed closely. A spring can be designed to the desired capacity by allowing for the amount of set which it is subject to take, then remove this set at a temperature slightly above that in which the spring is to operate, after which it will suffer no further loss in load.

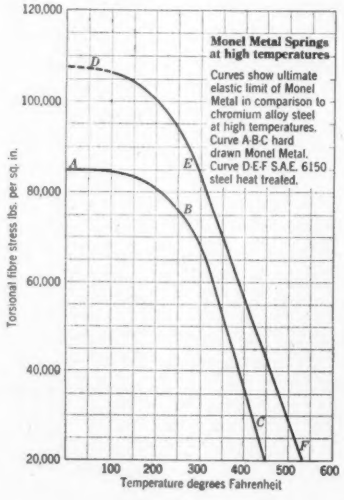


Fig. No. 3

The advisability of using Monel Metal lies not so much in the fact that it is mechanically superior to other metals under conditions of elevated temperatures, but particularly because it does not corrode as readily under those conditions. It is resistant to the action of steam, salt or lime water, a large number of organic acids and solutions, and at the same time will retain these properties at elevated temperatures.

Higher Resistance Alloys

Where the problem is not one of corrosion, but merely resistance to high temperature, it is often advisable to use some alloy spring steels, especially where the temperature condition is beyond the range of Monel Metal. Some chromium alloy steels, for example, have a heat characteristic at least 100° Fahr. above that of Monel Metal, for the corresponding

(*Please turn to page 62*)

Wire Rope Lubrication In Winter

Effects of severe weather on exposed equipment may be offset by use of seasonable lubricants

Reprinted from "Lubrication" through courtesy of The Texas Company

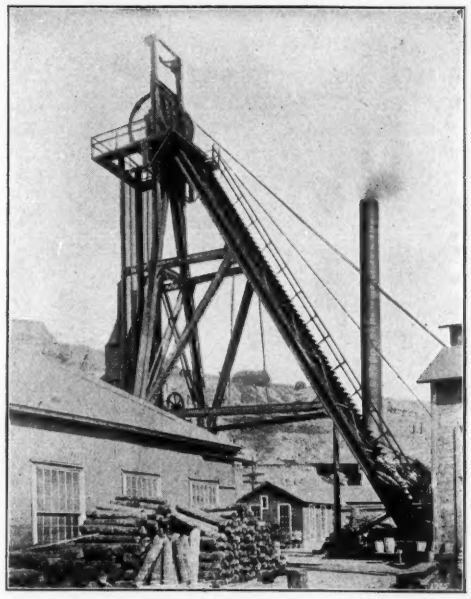
WITH the approach of cold weather, the lifting of materials in bulk, package or by the piece, for the purpose of transfer from one locality to another, will once again become a decided problem to many. A problem by virtue of the fact that very frequently their hoisting or materials handling equipment will be subjected to the rigors of snow, ice and rain, with the attendant effects upon lubrication, the development of abnormal friction and increase in costs of maintenance.

There is much to be said in connection with effective lubrication of hoisting and materials handling equipment in cold weather for there is a decidedly intimate relationship between lubrication, production and cost of upkeep. In general, the machinery involved is massive, with rugged gears, comparatively heavy duty bearings and wire rope of widely varying dimensions.

Protection Against Exposure

Where operations are carried out under cover with adequate provision for more or less heating, or at least where exposure to weather conditions can be guarded against, more nearly can the full benefits of proper lubrication be realized. Unfortunately, however, much of such equipment must operate in the open.

So the yard machinery must simply do extra duty, be it in the removal of ice or snow, or floundering through the mud, but always operating nevertheless. The brunt of such service will be borne by the gears, chains, bearings and wire rope, according to the type of equipment involved.



Courtesy of The Wellman-Seaver-Morgan Co.

For the hoisting of materials in the mining industry a form of skip hoist as shown here is frequently employed. Wire rope lubrication is especially important with such equipment if longevity and durability are to be assured in the presence of possible sulphur fumes, rain, and the normal effects of daily wear and tear.

Wire rope lubrication is one of the most important factors in any plant where materials in bulk such as ore, coke or coal are to be handled. For the ultimate efficiency of operation is, to a large extent, dependent upon the condition of the cables or wire ropes. It can be easily realized that a rope with one or two broken strands due to rusting or wear traceable to improper lubrication, may not only cause a tie-up of the entire machine if such strands interfere with the operation of sheaves, or other companion cables, but may also present a distinct hazard. Any wire rope in such condition is just that much weaker and less capable of handling the imposed loads.

It is not enough to assume that because such ropes come from the manufacturers in a lubricated state, being in general wound on an oil saturated core, that further lubrication is unnecessary. Under operation there is constant friction and wear between the strands, and a tendency to squeeze out any contained lubricant, especially when the ropes pass over sheaves or around drums. The renewal of this product is, therefore, an absolute necessity.

Mineral Lubricants Recommended

The matter of friction between the strands of a wire rope is essentially the same as friction between a bearing and shaft. Overheating and abnormal wear will practically always result, to reduce the load carrying capacity and increase the amount of power consumed in operation. This can only be overcome by effective lubrication, brought about by the proper application of a suitably prepared wire rope compound, which will be capable of not only penetrating to the innermost strands and core of the rope, but

also sufficiently adhesive and viscous to resist being prematurely squeezed out, or washed off by rain or sleet.

Essentially a wire rope lubricant, in addition to the properties mentioned above, must not tend to cake, gum or ball up, especially if contaminated with an excess of dust, dirt or metallic particles.

Furthermore, it must be resistive to the thinning-down effects of higher temperature. This, of course, directly involves the viscosity or relative fluidity of the product. In fact, viscosity of such products is the essential characteristic involved in purchasing. It should not, however, be assumed as being the chief guide as to the actual suitability of a wire rope lubricant.

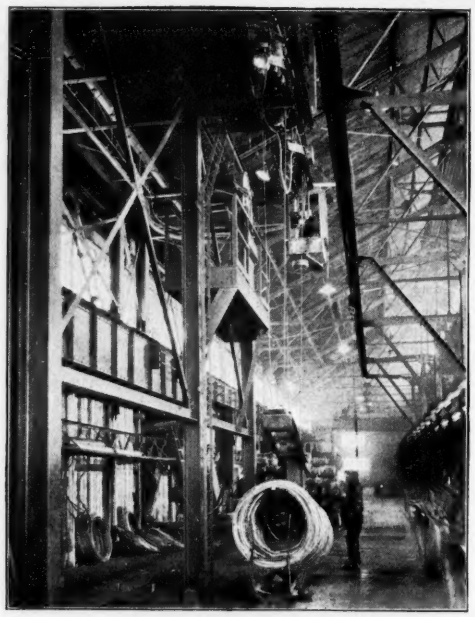
In this regard the ability of the latter to function, penetrate and stick under actual operating conditions, is of outstanding importance. In consequence such products should not be purchased haphazardly, nor on a price basis alone. The potential difficulties that might result in cold weather are too serious.

Viscosity and Temperature

According to the operating temperatures that may be involved, and the possibility of the presence of an excess of water, the viscosity of a wire rope lubricant should range from 500 to 1000 seconds Saybolt at 210 degrees Fahrenheit. In warm localities, as adjacent to ovens, furnaces, etc., where there might be possibility of such products thinning down to the extent of dripping off to perhaps result in lack of lubrication, it will be advisable to use a lubricant of approximately 1000 seconds viscosity, in accordance of course, with the temperature prevalent.

On the other hand, under relatively cold conditions as might be involved adjacent to the Great Lakes, in Canada or the Northwest, it would be advisable to use a thinner product, but again in accordance with the range of operating temperatures involved.

Wire rope lubricants to meet the aforesaid requirements should, in general, be straight mineral petroleum products, devoid of fillers or thickening mediums. In other words, whatever the viscosity, it should be an inherent property of the lubricant, not an artificial characteristic which cannot be depended upon.



Even though not directly exposed to severe out-door weather, wire rope used for interior service may be constantly in the path of dust, abrasives, etc., which easily accumulate on the rope and eventually work in between the strands unless an adequate protective film of lubricant is constantly maintained.

Courtesy of Cleveland Crane & Engineering Co.

It is for this reason that greases or soap-thickened mineral oils are relatively unsuited to wire rope lubrication. To attain the requisite body a comparatively high percentage of soap would be necessary. Soap, of course, serves as the carrying medium for the oil. It has relatively no lubricating value, however; as a result, this property in the resultant products is decreased to a marked extent. Furthermore, the adhesive characteristic of greases is low. In consequence such products will not, in general, meet the requirements of wire rope lubrication.

Hot Lubricants Essential

As a general rule wire rope lubricants, by virtue of their viscosity and inertness, must be applied in heated condition. To merely attempt to daub or paint a rope with such a product at normal temperatures would be relatively impossible. Even though the surface might be more or less coated, the possibility of penetration occurring to any extent would be remote. We must realize that this latter is the secret of effective wire rope lubrication. The amount of wear occurring between the exterior of such a rope and the sheaves is not as marked as that which occurs between adjacent strands when the rope is flexed or bent as in passing over sheaves or hoisting drums. On the other hand, bending promotes penetration of the lubricant.

The Split Box Method

A very satisfactory method of treating wire ropes is to use a form of split box through which the rope can be run. Such a box can be readily built in the average plant, with suitable provision for rendering it sufficiently tight to prevent the lubricant from leaking out, even when reduced in viscosity by heating. The slow passage of the rope through such a bath of heated compound will insure that not only will the surface be coated, but also that the requisite penetration takes place to the inner strands. Further slow working of the rope over the sheaves before the lubricant has time to cool completely will tend to aid in bringing about the maximum of penetration.

New Developments In Materials Handling

Saving in time and labor costs are responsible for rapid increase in use of skid platform shipments

By R. L. Lockwood

Division of Simplified Practice, Department of Commerce

THE World War taught a great many lessons, among which was the lesson that production methods had far outrun handling methods, particularly the handling of finished goods. In the case of hundreds of commodities, it took just as long to load a box car in 1920 as it did in 1880, whereas production methods during that period had been wholly revolutionized. Few accurate cost figures were available in connection with handling finished goods, such as were commonly known in connection with production, but a few engineers and executives began to recognize the vast difference between the highly developed machinery and methods of production and the primitive methods of handling goods.

Heavy Handling Costs

Recent studies of production processes throughout the country indicate that on the average 55 per cent of the cost of a manufactured article is expended in handling and moving material, and the other 45 per cent in actual fabrication or machine processes. In certain industries, notably the automotive industry, handling material has been reduced to its lowest possible terms; on the other hand, in the foundry industry, for example, there are many instances where it is necessary to move, handle, and rehandle material amounting to over 100 tons for each ton of finished castings produced.

Manufacturers of various kinds of handling equipment, notably two-wheeled and four-wheeled trucks, certain forms of conveyors, monorail and other trolley installations, and various other devices did their best to educate industry and commerce along these lines, but until after the World War progress had been very slow. However, another forward step in the history of moving objects was about to be accomplished. With the lessons of the World War in mind, and with increasing recognition of the conditions above described, more and more attention was focused on methods of handling finished goods. The necessary mechanical appliances were almost all available in some form, and needed only to be adapted to new uses. Among other devices for handling goods were lift trucks, operated either by hand or power, developed more than forty years ago and first used to handle stoves and similar objects supported on legs. The lift truck had come into fairly extensive use by 1915. There seems to be no record to show who first thought of building a separate lifting platform to go with the lift truck, in order to carry objects which did not happen to have legs under them.

The Modern Skid Platform

One of the oldest devices in the whole history of moving objects, the sled or sledge, had unrecognized possibilities, and after a long lapse of years was brought to life in the form of the modern skid platform or "skid." All sorts of objects could be loaded on it, and by the use of the lift truck the loaded platform could be picked up, taken to any desired place, and set down again. Lift trucks grew in size and capacity, power being applied to them in many cases. More and more plants began to use this method for handling a wide range of commodities. Loads increased steadily to a point where lift trucks are now made to handle loads up to ten tons, although the average is 2½ to 3 tons. Once the ancient sled and the modern lift truck had been brought together, their use in combination spread so rapidly that it is estimated that about 9,000,000 skids and 110,000 lift trucks are in service in the United States.

Opportunity for Economies

During the period in which the skid and lift truck were extensively developed, a parallel development took place in connection with industrial tractors and trailers, particularly for use in railway freight stations, ware houses, and steamship terminals. Numberless forms of hand or power-drawn trucks and trailers rapidly came on the market, all designed to reduce the time and the labor cost of handling miscellaneous goods.

Handling costs in railway freight stations were reduced from 25 to 75 per cent in many cases. A study made by the Transportation Division of the Bureau of Foreign and Domestic Commerce, covering a number of miscellaneous commodities, showed that of every dollar spent to get these commodities from the final machine or factory process into the hands of the consumer ready for use, 10 cents represented the actual rail or water transportation, and 90 cents the cost of packing,

(*Please turn to page 64*)

Contributed for presentation at the Annual Meeting of The American Society of Mechanical Engineers, New York, December, 1928.

NEWS *of the* INDUSTRY

Foreign Trade Opportunities

FOREIGN trade opportunities reported by the U. S. Bureau of Foreign and Domestic Commerce during the month of January include inquiries from the following sources: For electrical supplies of all kinds (35529) from Rosario, Argentina; for steel, spring (35532) from Lahore, India; for wire, annealed, 8, 9 and 10 gauge (35528) from Prince Rupert, Canada; for ball and rod mills (35583) from Vancouver, Canada; for bare copper wire (35778) from Helsingfors, Finland; for electric wiring supplies (35775) from Rosario, Argentina; for telephone line material (35932) from Chihauhau, Mexico; for enameled copper wire (35894) from Queensway, England; for bolts and wood metal screws (35903) from La Paz, Bolivia; for dead soft horseshoe nails (35904) from Sheffield, England; for steel wire (35901) from Ensenada, Mexico; for galvanized telephone wire (35932) from Chihauhau, Mexico.

Westinghouse Elects

ANDREW WELLS ROBERTSON of Pittsburgh, president of the Philadelphia Company, was unanimously elected chairman of the board of directors of the Westinghouse Electric and Manufacturing Company in a meeting of that board, held in its offices at 150 Broadway, New York City, January 16.

Mr. Robertson is of Scottish parentage. He is in his 49th year. He was graduated from Allegheny College, Meadville, Pa., in 1906 with a degree of AB and from the Law School of the University of Pittsburgh in 1910 with a degree of LLD. After practising law in Pittsburgh, he became General Attorney of the Philadelphia Company, which, with its affiliated companies operated all of the electric light and street railway properties and most of the gas properties in the Pittsburgh district. After having served for several years as Vice President of that Company in charge of public relations and the Law Department he was elected as its president in 1926, which office he has held since.

In addition to his important business activities, Mr. Robertson has been prominent in public affairs in Pittsburgh, especially in connection with the Pittsburgh Chamber of Commerce. Mr. Robertson will withdraw from his other business activities and devote his entire time to the Westinghouse Company. For the present his official headquarters will be in Pittsburgh.

Screw Machine Products Meeting

AT the annual meeting of the Screw Machine Products Association held in Chicago January 16, the following officers were elected: President, Fred H. Fischer, Fischer Special Mfg. Co., Cincinnati; Vice President, Scott Osgood, Curtis Screw Co., Buffalo; Secretary, Mac It Parts Company, Lancaster, Penna.; Treasurer, J. W. McDonough, The Sherman-Klove Co., Chicago. Dr. Swanson, of the Swanson Ogilvie Company, presented his report on a survey of cost finding methods showing present methods in sixteen plants supplemented by data gathered from sixty-eight questionaires. Production, methods of cost accounting, estimating and various trade policies were discussed together with many recommendations.

Mossberg Reports Progress

UNFILLED orders on hand that will require three months to clear away, where ordinarily a thirty-day business would be in prospect. A plant that has been working on a partial overtime basis and now goes onto a twenty-four-hour schedule. A substantial increase in size of plant in contemplation. This is the report that closes the year of 1928 for the Mossberg Pressed Steel Corporation, a reflection of better business conditions in New England and the country at large. This concern specializes in the design and manufacture of pressed steel reels, spools, vulcanizing pans, vulcanizing reels, braider carriers and allied equipment for the wire industry. It has also won an enviable reputation for the design and manufacture of pressed steel beams, beam heads and nonchafing drop wires for the textile industry.

The wire industry, speeded up by the demands of both electrical and radio requirements, has turned to better, stronger and more accurate reels and spools for wire drawing. And to both increase and improve their produst, manufacturers of insulated wire and cables have turned to the more substantial electrically welded, alloyed steel vulcanizing reels and pans, and to high-speed braider carriers for the outside covering of insulated wire. Mosspeed Braider Carriers increase the effective speed of standard braiding machines very materially, and the perfectly controlled, uniform tension made possible by the use of springs instead of weights in many cases effects a considerable saving in yarn as well as insures a better product.

Personal Mention

Wilmer Cordes has been appointed advertising manager of the American Steel & Wire Company, Chicago. Mr. Cordes succeeds Burley B. Ayers, resigned. Mr. Cordes assumed Mr. Ayers' duties on the latter's resignation.

Phillip L. Thompson, for the past eighteen years publicity manager of Western Electric Company, and with the firm for more than twenty-five years, has been given the title of director of public relations. He will be responsible for not only the advertising but for all of its organized activities through which it contacts with the public. W. A. Wolff assumes the title of advertising manager.

W. H. Martin, formerly with Union Wire Die Corporation, has been appointed sales manager of the Wire Die Division of the Carboloy Company, Inc., with headquarters at 350 Madison Avenue, New York City.

Obituary

Mr. William H. Bone, First Vice President and General Manager of the Ironsides Company, Columbus, Ohio, died December 19, 1928. Mr. Bone's most important connections were with the Pool & Hunt Co. of Baltimore, the Nordyke & Marmon Company of Indianapolis, and the Walker Mfg. Co. of Cleveland. He had been First Vice President of the Ironsides Company from 1898 until the time of his death.

Building and Expansion

Canadian Wirebound Boxes, Inc., 1000 Gerard Street East, Toronto, Canada, has purchased property adjoining its present plant and is preparing to build additional factory.

Signode Steel Strapping Co. has been organized by officials of Consolidated Steel Strapping Co., 2600 North Western Avenue, Chicago, with a capital of $3,000,000, to take over the older organization. A new stock issue will provide funds for expansion.

Atlas-Ansonia Co., New Haven, Conn., is the title of the consolidation of the former Atlas Mfg. Co., manufacturers of wire forms and other specialties and the Ansonia Novelty Co., formerly of Ansonia, Conn.

COMING EVENTS

Feb. 6-13. Aviation Show at New York. Secretary, L. L. Anderson, 152 W. 42nd St., New York City.

Feb. 12-15. Chicago Power Show and Midwestern Engineering Exposition at Chicago. Secretary, G. E. Pfiisterer, 53 W. Jackson Blvd., Chicago.

Feb. 18-Mch. 1st. British Industries Fair. Auspices of British Government. London and Birmingham, England.

Feb. 18-19. Associated General Contractors of America at Chicago. Secretary, D. H. Sawyer, Munsey Bldg., Washington, D. C.

March 4-7. National Railway Appliance Exhibition at Chicago. Secretary, C. W. Kelly, 1014 S. Michigan Ave., Chicago.

Mch. 13-14. Annual general meeting of the Institute of Metals. Hall of the Institution of Mechanical Engineers, Storey's Gate, S. W. 1, London, England.

Mch. 15. International Exposition. Seville, Spain. Hon. Thomas E. Campbell, U. S. Commissioner.

April 8-12. American Foundrymen's Assn. at Chicago. Secretary, C. E. Hoyt, 222 W. Adams St., Chicago.

April 15-17. American Zinc Institute at St. Louis. Secretary, S. S. Tuthill, 27 Cedar St., New York.

May 6-11. Chemical Show. Grand Central Palace, New York City. International Exposition Company; F. W. Payne, President.

June 3-6. National Assn. of Purchasing Agents at Buffalo. Secretary, George A. Renard, 11 Park Place, New York.

June 5-7. Canadian Electric Railway Assn. at Montreal. Secretary, E. Smith, Jr., 35 Yonge St., Toronto.

For the expediting of shipments of brass and copper to their mid-western customers, the Chase Brass and Copper Company has made plans for the erection of a branch plant in Cleveland, Ohio.

Freas-Therms Electric Co., Irvington, N. J., manufacturers of electric equipment, has awarded contract for a factory unit to cost about $50,000 with equipment.

Standard Underground Cable Co., Pittsburgh, has bought additional property adjoining its Perth Amboy, N. J., plant for the site of a new wire and rod mill to cost upward of $200,000. H. V. Wodtke is general manager.

Dudlo Manufacturing Co., Fort Wayne, Indiana, division of General Cable Co., has awarded contract for additional factory unit to cost about $80,000 with equipment.

A delegation from the Soviet Russian Government, making purchases of machinery and equipment from American manufacturers, has headquarters at the offices of Amtorg Trading Corporation, 165 Broadway, New York City, official buying agency of the Soviet government.

Belden Manufacturing Co., 2300 South Western Avenue, Chicago, insulated wire and cables, will build and equip a Plant at Richmond, Indiana, at an estimated cost of $150,000.

Flint Ornamental Iron & Wire Works, Flint, Michigan, is planning a new one-story plant at an estimated cost of $25,000.

Crescent Insulated Wire & Cable Co., Olden and Taylor Avenues, Trenton, N. J., has awarded contract for additional factory unit estimated to cost $85,000 with equipment.

Andrews Wire & Iron Works, Rockford, Illinois, is building a one-story addition to cost about $50,000 with equipment.

W. S. Tyler Co., Cleveland, Ohio, has purchased a site on Ontario St., St. Catharine's, Ontario, Canada, for a factory to manufacture woven wire screens, screening equipment and other of the company's products.

Rome Wire Company, Rome, New York, is building and equipping additional factory space occupying about 41,000 square feet of floor space at an expenditure estimated at $250,000. The addition will supply increased facilities for the manufacture of "trenchlay", one of the company's recently developed cable products.

Sleeper & Hartley TRADE MARK

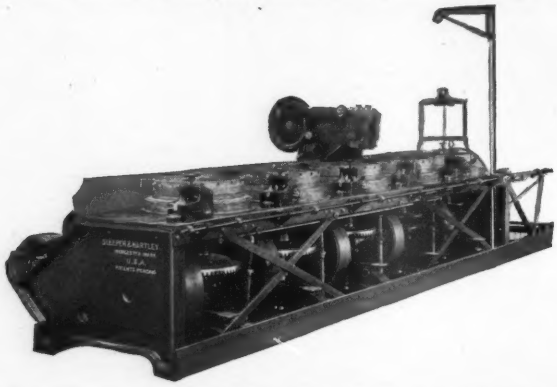
Practical Continuous We

These Machines Go Into Production at —R

Rod Frame

(No. 5—14 or 15 wire)
Patented June 3, 1924—May 12, 1925—others pending

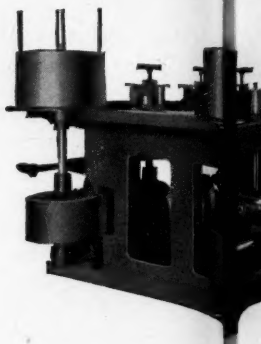
All Ball or Roller Bearings
No Differential Gearing.
Automatic Compensation for Speeds of Heads.



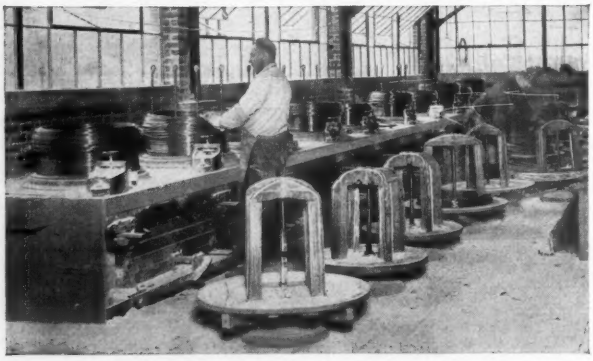
Double 5-Draft

No. 14 to No. 23.
3 to 4 Blocks
No. 14 to 19—4
No. 14 to 20—5

More than 270 heads of

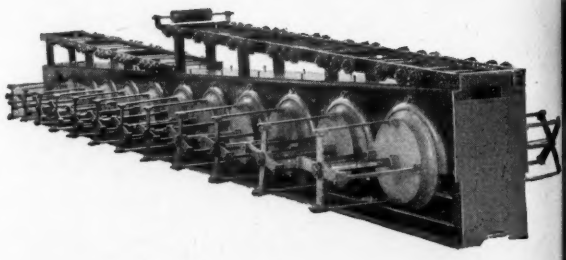


IMPROVED WIRE MILL EQUIP



Standard Rod Frame—10 Block

Long, Stiff Spindles, in anti-friction bearings, and equipped with friction Clutches. Powerful and reliable.
Practically noiseless in operation.
(New Plant of Thompson Wire Co., Worcester, Mass.)



Patenting Furnace Take-Up

(New Plant of Thompson Wire Co., Worcester, Mass.)

AGENTS: CHICAGO TERRITORY
Neff, Kohlbusch & Bissell, Inc.

SAN FRANCISCO AND LOS ANGELES
Louis G. Henes

SLEEPER &

FOREIGN AGENTS AND REPRESENTATIVES: UNITED KINGDOM—Mr. Fredk. A. Perry, 63 Queen Victoria St., London, E. C. 4.
FRANCE—Mr. Edgar Bloxham, 12 Rue du Delta, Paris. BELGIUM— Isbecque, Todd & Cie., 25-27 Boul. Emile Bockstael, Brussels.
MONTREAL AND TORONTO—Arthur Jackson Machine Tool Co.

WORCESTER

We Drawing Machinery

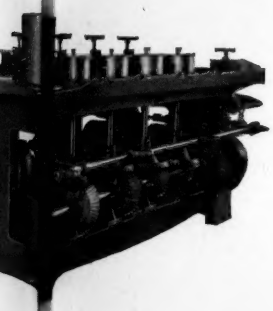
Sleeper & Hartley TRADE MARK

REG. U.S. PAT. OFF. & PRINCIPAL FOREIGN COUNTRIES

on at —Reducing Overhead-Increasing Production!!

Draft, Intermediate

No. 23. For low carbon wire.
6 Blocks to Average Operator
9—4 h.p. 400 lbs. per block.
10—5 h.p. 100 lbs. per block.
Hundreds of improved model in operation

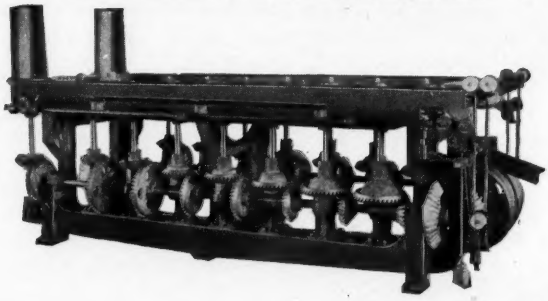


Double 8-Draft Fine Wire: Wet

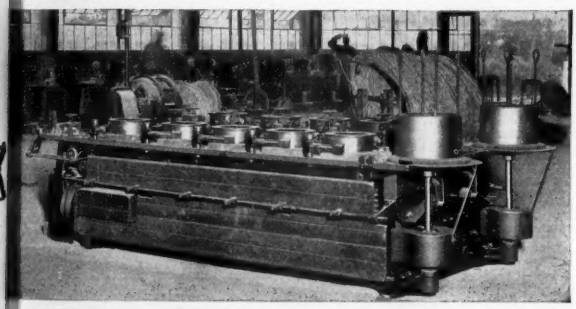
No. 22 to 36. High or low carbon wire.

6 Blocks to Average Operator, 22-33, 8-hole, 660 lbs. per day of ten hours.

Many thousands of these heads in operation



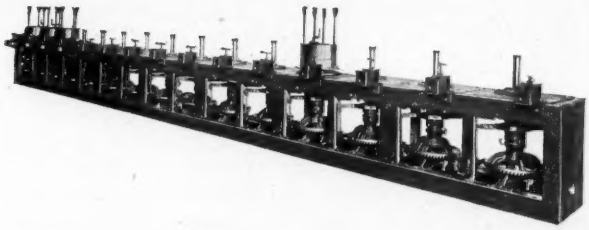
EQUIPMENT RECENTLY INSTALLED



Double Six—Draft Dry Continuous For High Carbon Wire

Direct driven with silent chain. Cut gears throughout. Anti-friction bearings. Variable speed for finishing block.

(New Plant of Thompson Wire Co., Worcester, Mass.)



Heavy 16" Frame For .65 Carbon Wire No. 10½ to .037"

15 Blocks: Motor driven. Silent chain. Anti friction bearings and cut gears throughout.

(New Plant of Johnson Steel & Wire Co., Worcester, Mass.)

Sleeper & HARTLEY, Inc.

Worcester, MASS., U. S. A.

Agents: Philadelphia Territory
Swind Machinery Co.

ITALY—Henry Coe & Clerici, Milan. AUSTRALIA AND NEW ZEALAND—Edwin Wood Pty., Ltd., Melbourne.
JAPAN—Andrews & George Co., Tokyo. SWEDEN AND FINLAND—Maskinaktiebolaget Karlebo, Stockholm.

The Australian Market For Wire Screen Cloth and Wire Netting

Improved status of home industry, prison labor, and local price competition reduce demand for our exports

IN a report to the Department of Commerce, Assistant Trade Commissioner Charles F. Baldwin, stationed at Melbourne, writes as follows about trade conditions in the antipodes as of October 15, 1928.

There is a good demand for wire screen cloth in Australia, particularly in seaside and country resorts, owing to the prevalence of flies and mosquitoes. It is used principally for sleepouts, window screens, and screen doors.

Local Monopoly on Market

The Australian wire screen cloth market is controlled by the Cyclone Fence & Gate Co., Pty., Ltd., 191 William Street, Melbourne, who have plants in both Melbourne and Adelaide. This local concern is turning out galvanized and bronze screen wire cloth of very good quality, which with the protection of 45 per cent import duty makes it exceedingly difficult for American manufacturers to compete. Formerly, it was complained that the local wire would not stand stretching, but it is now said to compare favorably with the imported article.

Galvanoid wire is not manufactured locally. This last is used principally in seaside resorts where galvanized wire rusts from the salt air. American manufacturers are still doing a fair business in galvanoid, but the demand is falling off, owing to the fact that bronze wire, which is turned out locally, is coming to be used largely instead of galvanoid.

American manufacturers of galvanized and bronze screen wire cloth have found it increasingly difficult to compete with the local products during the past few years. According to reports from the trade, where American manufacturers were at one time selling several million square feet of screen wire cloth a year in Australia, sales have now dropped to approximately 20,000 square feet, and there are no prospects of an improvement in the future.

Price War on Galvanized

During the past year, American manufacturers of galvanized wire reduced their prices, and the local company then brought down its prices to compete with them. Approximately 90 per cent of the galvanized wire screening used here is said to be 12-mesh, 33-gauge. Some very fine imported mesh has been selling in Queensland recently, but the demand is limited.

At present, 12-mesh 33 gauge galvanized of American manufacture is quoted at $1.90 per 100 square feet, in addition to approximately 70 per cent to land (including 45 per cent ad valorem duty, together with freight and insurance), making the American landed price $3.23, as compared with the (approximate) local price of $3 per 100 square feet, less 5 per cent.

In bronze wire, 20, 24, and 36 inches wide, 14-mesh by 0.01185, the American product is selling at $4.90 per 100 square feet, which amounts to approximately 4½ pence per square foot landed here. Local bronze wire is quoted at 3¾ pence per square foot, and local buyers are guaranteed against any drop in prices.

Owing to the reduced price of galvanized wire, the demand for green painted wire screen cloth has ceased, and those firms holding stocks were forced to sell at greatly reduced prices to dispose of them.

Wire Netting Industry Thrives

Australian manufacture of wire netting is the subject of another report from the U. S. consular office at Melbourne under date of October 30, 1928. It follows in full.

For a number of years the manufacture of wire netting has been one of the principal industries carried on at the State prison at Pentridge, Victoria. This industry has developed to such an extent that it is now almost able to supply the full needs of the Victorian Lands Department, which makes wire netting available to land settlers on easy terms, in order that they may make their holdings rabbit and vermin proof.

In an article published in the Melbourne "Age" of October 19, 1928, the following particulars were given regarding this industry:—During 1927, 740 miles of 1½ inch gauge wire netting valued at £32,000 was manufactured at Pentridge, all of which was supplied to the Lands Department. The requirements of the Department for that year, however, were 1,560 miles, valued at £70,000, 820 miles of which were supplied by other Australian factories.

(*Please turn to page 62*)

Diamond Die Drilling

The only important advance that has been made for years in the drilling and recutting of diamond dies for wire drawing will be reported at length in an article in the March issue of

Wire & Wire Products

DIGEST OF RECENT TRADE LITERATURE

Methods of Test Relating to Electrical Insulating Materials. American Society for Testing Materials, Philadelphia. 152 pages. Illustrated. 85 cents.

Contains in one volume all the tests and specifications for insulating materials developed by the A. S. T. M. over a period of several years. Standard methods are described for testing molded insulating materials and electrical insulating oils, and standard specifications are given for friction tape for general electrical purposes, rubber gloves for electrical workers, rubber matting for electrical apparatus, tolerances and test methods for electrical cotton yarns, and for electrical tapes of silk and cotton. The tentative testing methods described cover insulating varnishes, electrical porcelain, sheet and tape, untreated paper, laminated and solid sheet, varnished cloth tape, insulating materials, cable splicing and pothead compounds, and there are also tentative specifications for rubber insulating tape.

The Rod Mill Electrification at the South Works of the American Steel & Wire Company. Iron and Steel Engineer. December, 1928. P. 501.

Within the past eighteen months this plant has undergone an almost complete replacement and electrification of its hot rolling mills, only one steam-driven unit remaining. Among the innovations described is a new wire rod mill said to be the fastest and best of its kind in the world. It is a double line mill with separate finishing trains. The roughing and intermediate trains are both driven from the same motor, which is rated at 3000 horse power at 50° C. rise and has a speed range of 180 to 370 r. p. m. by field control. Each finishing train is driven by an 800 h. p., 50°C. rise motor with a speed range of 535 to 750 r. p. m. The operator of the mill is located aloft at a control desk provided with electrical equipment for instant and accurate control of all the operations below.

Some Properties of Cold Drawn and of Heat Treated Steel Wire. Proceedings, Iron and Steel Institute, London, England. September, 1928.

A report of tests on the effect of heat treatment on cold drawn alloy steel (chromium-vanadium) wire made by S. H. Rees, B. Sc., of the Research Department, Woolwich. A study was made of the effect of low temperature on mechanical properties, on tensile strength, miscrostructure, dimensions, behavior under stress, and on permanent set at elevated temperatures. The examination of the properties of the alloy wire shows that conclusions previously arrived at in connection with carbon steel wire are applicable when suitable modifications of the quantitative data have been made.

Trade Literature Received

Heat Treating

"Electric Heat in General Electric Factories." General Electric Company, Schenectady, N. Y. 32 pages. Illustrated from photographs. Electrically heated annealing and heat treating equipment and its industrial applications are described and illustrated with pictures of G. E. factory installations. There are furnaces for a great variety of purposes, including one with a capacity of 36 tons a day for bright-annealing copper wire, a sherardizing drum furnace for bolts, nuts, etc., vacuum impregnating tanks for insulating coils, and melting pots for white metals such as are used for tinning steel and copper wire and strip.

Reels and Spools

"Reels and Spools for the Wire Industry." Mossberg Pressed Steel Corporation, Attleboro, Mass. Catalog No. 104. 40 pages. Illustrated. Listings and descriptions of pressed steel reels, spools and similar appliances for the wire industry. Includes reels for annealing, handling, take-off, braiding, stranding and shipping round and flat wires in all sizes; shop and special spools, wire weaving spools; reels for vulcanizing and impregnating; swifts, vulcanizing pans, braider carriers, cop holders and bobbins.

Chemicals

"Chemicals." The Kalbfleisch Corporation, 200 Fifth Avenue, New York City. 84 pages. Illustrated. A handbook that is much more comprehensive than the conventional catalogue of industrial chemicals. The data given is designed to simplify the purchase of chemicals and to make it an exact and economical operation. To that end the text presents concise facts, tables, etc., about quality, uses, technical service, storage, shipping etc., of the company's products.

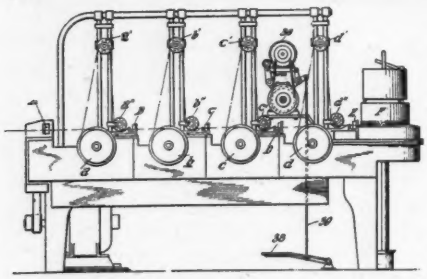
Safety Devices

"A Buyer's Guide for the Safety Man." National Safety Council, 108 E. Ohio Street, Chicago. 36 pages. A directory of manufacturers and dealers of equipment, service and supplies for accident and fire prevention, health, sanitation, and industrial welfare generally.

Electrical Progress

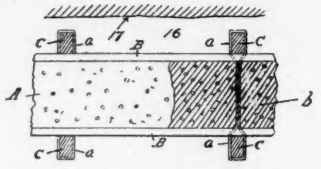
"Engineering Achievements." Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. 24 pages. Illustrated. A brief descriptive review of outstanding examples of the trend of the electrical industry as indicated by new and exceptional developments in production of the company's materials, equipment, etc., during 1928.

A REVIEW OF RECENT PATENTS



Process For Pointing and Drawing Wire 1,696,698

Complete descriptions and drawings of any of the patents referred to on this page may be had for twenty five cents. Address orders to Wire & Wire Products, 551 Fifth Avenue, New York City.



Cutting Tool For Tie Wires or Bands 1,695,022

No. 1,696,698, PROCESS FOR POINTING AND DRAWING WIRES. Patented December 25, 1928, by William H. Sommer, of Peoria, Illinois. A method for pointing and drawing wire or the like through a series of successive reducing dies of a continuous wire drawing bench, which resides in initially shaping the end portions of the wire to provide same with a succession of reduced portions, which latter correspond approximately in diameter to the diameters of the reducing dies of a wire drawing bench, and then in threading the end of least diameter into the reducing die of greatest diameter and moving the wire until the various diametered portions are in register with the respective reducing dies of corresponding diameter, and finally in drawing the wire through the reducing dies.

No. 1,695,022, CUTTING TOOL FOR THE TIE WIRES OR BANDS OF CONCRETE BUILDING FORMS, BARRELS, BOXES, BALES, AND THE LIKE. Patented December 11, 1928, by Ollie Warren Rankin, of Covington, Kentucky. Assignor to the Dawson-Evans Construction Co. of St. Bernard, Ohio. A tool adapted for use in cutting or severing the binding wires of concrete or other temporary building forms or frames when they are to be dismantled. This wire cutting implement is equally as well adapted to the purpose of removing binding tie wires from boxes and the like.

No. 1,695,595, ELASTIC METAL STRINGING AND METHOD OF MAKING THE SAME. Patented December 18, 1928, by William A. Larned, of Summit, New Jersey. Assignor to the Dayton Steel Racquet Company, of Dayton, Ohio. This stringing is made up of wires that are first wound into groups, after which the groups themselves are wound together and then stretched to a blocking point, or a point beyond which the stringing has a maintained elasticity due to the torsional reaction grouped upon each other. This construction permits of the stringing of tennis racquets and the like.

No. 1,695,149, FENCE WIRE SPACER AND HOLDER. Patented December 11, 1928, by Roy Huston, of Seattle, Washington. This invention relates to wire spacing devices especially designed to aid in properly spacing and positioning fence wires when securing the same to posts, an object being to provide a device for this purpose which may rest upon the ground to raise and hold the wires in place, or held against raising to depress and space the wires in such manner as to hold them in proper spaced relation while they are being attached, and leave the hands of the workman free to attach the wires.

No. 1,695,255, WIRE WORKING MACHINE. Patented December 11, 1928, by Geo. F. Matteson, of Rockyhill, Connecticut. Assignor to the F. B. Shuster Company, of New Haven, Connecticut. A machine more especially adapted for straightening and cutting wire into definite lengths.

No. 1,695,371, SCREEN. Patented December 18, 1928, by Andrew L. Felde, of Barnesville, Minnesota. A wire screen assembly to be used as a sorting belt, designed particularly for grading potatoes or other vegetables, the construction providing openings of circular contour.

No. 1.696,889, ATTACHMENT FOR WIRE ROPE. Patented December 25, 1928, by Rumsey W. Scott, of Montclair, New Jersey. Assignor to American Cable Company, Inc., a Corporation of Delaware. This invention relates to appliances for testing the strength of attachments secured to wire ropes and is of particular utility when utilized for field tests of fittings attached to elevator ropes. This patent was granted on a divisional application, the original application having been filed March 9, 1926.

No. 1,694.922, DRAWING APPARATUS. Patented December 11, 1928, by Delamar C. Kinnear of Waterbury, Connecticut, Assignor to the American Brass Company, of Waterbury, Connecticut. A new and improved tool for applying tubular connectors to adjacent ends of two electric conductor wires. The tool has spring actuated clamping jaws for the work and manually controlled means for holding the jaws in open position and releasing them when desired.

1,681,414. DETACHABLE HANDLE, Patented August 21, 1928, by Buntaro Kumagai, of Los Angeles, California. A handle comprising a resilient wire of helical convolutions looped along its major axis so as to provide sets of convolutions arranged side by side, the ends of said wire being secured to hold the end convolutions interlaced, whereby said sets may be moved toward each other with other of the convolutions overlapping and interlaced.

1,681,418. FOLDING RACK OR HOLDER, patented August 21, 1928, by Andrew J. Livesay, of White Sulphur Springs, West Virginia. This invention relates to a folding rack or holder for various articles, the general object of the invention being to form the rack of wire and to hingedly connect to the bottom thereof a yoke shaped member for holding papers, towels and the like.

No. 1,695,603, MACHINE FOR MANUFACTURING WIRE GARMENT HANGERS. Patented December 18, 1928, by F. Magidson, of Pittsburgh, Pennsylvania. Assignor, by direct and mesne assignments, to Star Service Hanger Company, of Detroit, Michigan. A machine, by means of which the patentee claims that the wire garment hangers, so widely used by cleaners, may be made in relatively large quantities and at a very low cost.

No. 1,695,791, LEADING-IN WIRES FOR EVACUATED CONTAINERS AND PROCESS OF MAKING SAME. Patented December 18, 1928, by J. A. Yunck, of South Orange, New Jersey. A special alloy metal and method of producing the leading-in wires for electric lamps, radio tubes, and the like. An alloy of copper and silver is used, with a minor proportion of tin, but the tin may be omitted, and an alloy of copper and silver alone employed. The silver must always be in excess.

No. 1.696,697. APPARATUS FOR POINTING WIRES. Patented December 25, 1928, by William H. Sommer, of Peoria, Illinois. Wire pointing means for permitting the insertion of the wire to be drawn through a reducing die. The apparatus progressively produces on an end of a wire a series of stepped elongations of successively reduced diameters.

Sheffield Opens New Wire Mill

THE Sheffield Steel Corporation began the New Year with the manufacture of wire products in its new 3-million-dollar wire mill. For the first time wire products from steel were made in a complete process in Kansas City. Some wire has been made here before, but it was from raw products purchased in the East.

This new plant which manufactures wire, nails, field fencing, baling ties and other products for the use of agriculturists, makes all its products from waste material. It takes the worn-out implements of the farmer, worn-out motor cars, railroad locomotives, any form of iron and steel waste, and converts it into finished products, which go back to the farmer. No pig iron is used in any of the processes.

The products of the company will be distributed in a trade territory comprised of the Dakotas, Iowa, Nebraska, Missouri, Kansas, Oklahoma, Arkansas and Texas.

Additional "open hearth" space must still be provided before the plant operates at its greatest efficiency. With the present number of furnaces and the demand put upon them by the present business of the company, it is not possible to purify enough scrap metal to permit the wire mill to work at capacity.

The wire mill was constructed while all other departments of the steel shops worked at capacity. It was constructed by the Morgan Construction Company, of Worchester, Mass., engineers and specialists in wire plants, Fred Westphal, who was formerly with the United States Steel Corporation, has been employed to supervise operation of the plant. Lester Shraub, formerly with the Keystone Steel and Wire Company at Peoria, Ill., will be in charge of the sales force.

Handy Silver Solder

IN WIRE DRAWING

Large wire manufacturers are now using "Handy" Silver Solders for joining lengths of heavy wire-rod before they are drawn to smaller sizes, some down to .002" or less. Also for splicing finished wire to make continuous lengths.

"Handy" solders make exceedingly strong joints on steel, iron, copper, brass, or any other metal fusing above 1400° F. Their strength, toughness and malleability fit them ideally for wire drawing. Joints have a tensile strength ranging from 40,000 to 60,000 lbs. per square inch.

The well-known resistance of silver to corrosion by acids or alkalies or to weather-exposure, also its high electrical conductivity, contribute to the suitability of silver solders for brazing wire and wire products.

"Handy" Silver Solders

are offered in twelve different guaranteed formulas, ranging in silver content from 80% down to 10% and in fusing point from 1325° F. up to 1600° F.

Let Us Help

Our service department will co-operate promptly in helping you determine which of our compositions, lowest in silver—and hence least expensive—will best serve you. Tell us about your welding, brazing and soldering problems.

The "Handy" Solder Book WW

contains much valuable information. Send for a copy.

HANDY & HARMAN

General Office:

57 WILLIAM STREET, NEW YORK CITY

PLANTS: Bridgeport, Conn. Providence, R. I. Fulton and Gold Sts., New York City.

Steel Drums

for

Shipping Reels

WHY

have they been adopted as standard equipment by one of the large users of shipping reels

?

Report of test on

"Steel Drums

for

Shipping Reels"

tells the story.

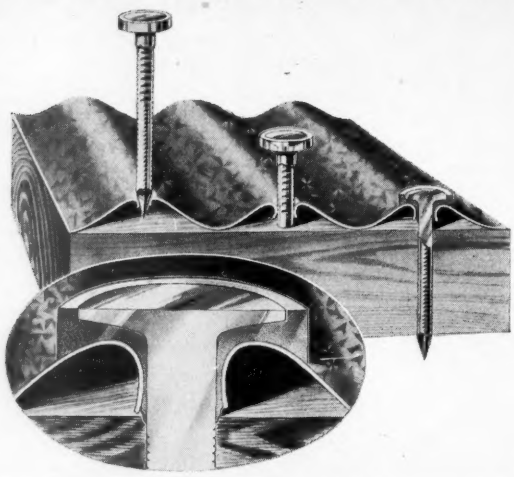
WRITE FOR COPY

R. B. Hayward Co.
1714 Sheffield Avenue
Chicago, U. S. A.

Manufacturers of

"RED HEAD"
SHIPPING REELS MACHINE
for the Wire & Cable Industry

Lead-Headed Nails For Galvanized Sheets

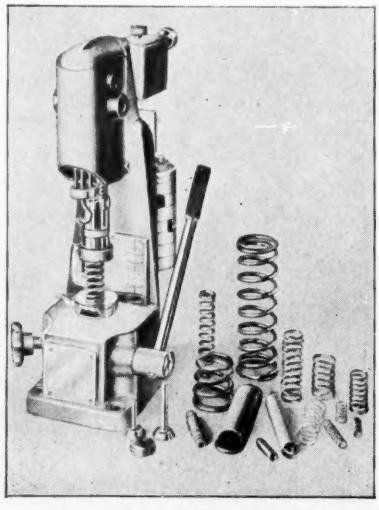


LEAD-HEADED nails with the lead placed underneath the head of the nail, is a specialty of the Deniston Company, 3101 W. Harrison Street, Chicago. Lead-headed nails are used in the building industry for attaching sheet metal siding and roofing. They are used as a protection against the rust that forms about the edge of nail holes in galvanized sheet and that attacks the nail just under the head at the neck. The object of the Deniston nail is to have all the lead under the head so that blows of the hammer hit directly on the steel head thereby driving the nail tighter in place and avoiding knocking the lead protection out of place or loosening it from the nail. The nails are made in bright finish, galvanized finish, and pure copper—all No. 10 gauge—and in three sizes, 1½, 1¾, and 2-inch.

New Pendulum Spring Testing Machine

ELASTICOMETER testing machines of 224, 448, 1120 and 2240 lb. load capacity for inspecting springs of various lengths for elongation and compression are announced by the Coats Machine Tool Co., 110 W. 40th St., New York City. These machines are intended to supply the demand for equipment capable of large loads and permiting rapid inspection on a production basis. They do not displace the older 180-pound Elasticometer, but the new ones, designated as type D, do not require the weights necessary with the older model. Instead, there is a pendulum which oscillates between an upper and lower scale where loads are read directly.

In order to accommodate springs of greatly varying length, the basic design has been so arranged as to keep the drive and the weighing mechanism separate, one each in a cast-iron housing connected by two tubular pillars or columns, the length of which may be chosen to suit individual needs. Each machine has two load ranges. On the D-200, for in-



The Elasticometer

stance, one would read the upper scale from 0-112 lbs. with only the upper weight on the pendulum. This scale indicates each pound. With the larger lower weight attached to the pendulum, the lower scale should be read 0-448 lbs., each division indicating 7 lbs.

Depending upon the type of drive, which varies according to the load range, the type D machines are in three groups. In the first group, for loads up to 224 lbs., the drive is by hand lever and rack and pinion. The maximum stroke is 6 ins. From 300 to 400 springs an hour can be inspected. An adjustable stop is provided and tolerance markers are arranged on the load-indicating scale to facilitate inspection work.

Machines in the second group, 448 and 1120 lbs., are also driven by hand lever and rack and pinion, but the rack is bored to receive a threaded spindle turned by a hand wheel which permits fine adjustment for testing strong springs. The stroke of the rack is 5 ins. and the vertical adjustment of the screw spindle is 3¼ ins., giving a total adjustment of 8¼ ins. The dual drive adapts both of these machines for testing weak as well as strong springs. The drive of the D-1000 machines, for loads up to 2240 lbs., is through a screw spindle and bevel gears.

For testing springs of unusual design, additional equipment, such as circular distance pieces for the pressure plates, intermediate hooks and guide pins for very slim compression springs, etc, are supplied separately.

DELIVERY has been made of the first piece of what will be the most powerful single-shaft, single-unit electrical generating machine in the world, which is being built at the Schenectady plant of the General Electric Co., for the East River Generating Station of the New York Edison Co.

The shipment makes eight carloads. The armature when fully wound, will weigh 375 tons.

"PREMIER"
Trade Mark of D. H. Co.

. . "Your Dies Are Very Satisfactory" . .

Says Wire Manufacturer

This manufacturer was so pleased with "Premier" dies that he sat down and wrote us about them.

Satisfactory service is insured by Driver-Harris' 20 years experience in drawing alloy wires.

"Premier" Diamond Dies draw true to expectation any metal in any size suited to diamond die drawing—with a marked decrease in interrupted production—repair work—and replacement costs.

Let us demonstrate the advantage of "Premier" Diamond Dies.

DRIVER-HARRIS COMPANY
HARRISON, NEW JERSEY
Chicago - Detroit - Morristown, N.J. - England - France

Alloy Makers since 1899

PATENTS
TRADE-MARKS
SERVICE

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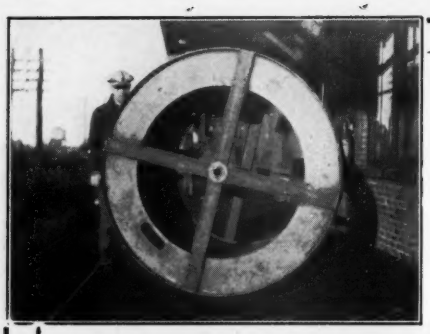
Evidence of Conception

Before disclosing your invention to anyone send for blank form "EVIDENCE OF CONCEPTION" to be signed and witnessed. As registered patent attorneys we represent hundreds of inventors all over the United States and Canada in the advancement of inventions. The form "Evidence of Conception," sample, instructions relating to obtaining of patents and schedule of fees sent upon request.

LANCASTER & ALLWINE
473 OURAY BUILDING
WASHINGTON, D. C.
Originators of forms, "Evidence of Conception."



An
Apco Mossberg
Big Boy all ready
to go to work

For every wire working or handling need there is an Apco Mossberg pressed steel reel, spool or bobbin ready to go to work.

They are light and durable, accepted throughout the wire industry as real cost savers. For vulcanizing, stranding, annealing or stripping get your reels from Apco Mossberg, headquarters for pressed steel equipment since Spanish War days.

APCO MOSSBERG CORPORATION

ATTLEBORO, MASS.

Specialists in pressed steel equipment for wire workers.

The Australian Market For Wire Screen Cloth

(Continued from page 56)

There is now being installed at Pentridge additional equipment, which will practically double the output of the factory. The new machinery to be installed is being made by Australian firms. The bulk of the wire used in the Pentridge factory is manufactured at the Broken Hill Steel Works, Newcastle. The wire netting is made available to settlers by the Lands Department at the rate of £43 17s. 6d. per mile, which is stated to be about £2 per mile less than the price at which it can be supplied by manufacturers.

Large quantities of wire netting are manufactured in Australia, principally in the State of New South Wales, and local manufacturers are protected from foreign competition by an import tariff of £10 per ton, wire netting being admitted free from the United Kingdom. Imports of this product increased largely during 1926-27 when 90,610 hundredweight (112 pounds) were imported, compared to 62,070 hundredweight the previous year.

The United Kingdom was the principal exporting country, although Germany also supplied 7,797 hundredweight and 30,488 hundredweight for the years 1925-26 and 1926-27, respectively. The Melbourn "Angus" of October 19, 1928, announced that Australian manufacturers are now in a position to issue revised price lists, which will be more favorable to consumers in Australia than price lists of imported goods.

Monel Metal Springs For High Temperatures

(Continued from page 48)

stresses shown on the diagram (Fig. No. 3). Moreover, most chromium alloy steels when properly heat treated have higher physical properties initially than Monel Metal and thereby have greater possibilities from the standpoint of design.

AUTOMATIC
Wire Working Machinery
FOR SALE
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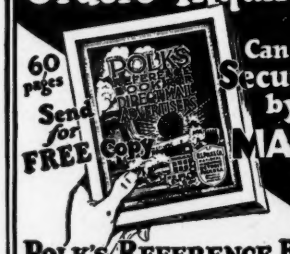

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The diagram (Fig. 2) shows the loss in load sustained by springs made of Monel Metal wire when under stress at elevated temperatures. Each curve represents a different original stress on the spring and the corresponding loss under heat for that stress. The torsional stresses shown are computed from the load on the spring.

The full lines are all for springs which were "over coiled" i. e., coiled at a pitch beyond their original elastic limit, were compressed to solid, thereby cold working the material up to its ultimate elastic limit, and then given a draw of 525° Fahr. to relieve the internal strains.

The long line A-B-C encloses the area of no loss of load and might be called the ultimate elastic limit curve for all temperatures. Beyond this line the springs all lose in load for the corresponding temperatures.

The dotted line represents the same values for original elastic limit and should be used as a guide in the design of extension springs.

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WIRE & WIRE PRODUCTS
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New Developments in Materials Handling

(*Continued from page 51*)

handling, loading, unloading, rehandling, unpacking, etc., including the cost of packing materials.

This study, together with similar studies of a specific nature, attracted wide attention on the part of engineers and executives, as indicating the vast and untouched possibilities for saving money in this field. This knowledge, together with the constantly narrowing opportunity for saving money in production processes, still further accelerated the effort to reduce costs in handling finished commodities.

Skid Platform Development

The most recent notable advance in moving objects has been the development and growth of the practice of shipping goods on skid platforms. First undertaken in connection with shipping paper, the practice has spread to numerous other industries. In the automotive industry, for example, more and more firms are requiring shipment of material and parts to their plants on skid platforms, thus avoiding rehandling and saving much time and labor.

During the year 1927 about 19,400,000 carloads of miscellaneous commodity freight were handled on our railroads. Of this tremendous bulk a considerable proportion is of such a nature that it can be packed and shipped on skid platforms. It is estimated that the present cost of handling such commodities, as distinct from their transportation, amounts to over eight hundred million dollars per year, out of a total of something over two billion dollars.

The practice of shipping goods on skid platforms is particularly interesting in that it represents a wholly new development in materials-handling equipment. Practically every other machine and device for handling material is used locally, in or about some one plant or establishment. The skid platform, on

the other hand, when used for shipping goods by rail or water, may be sent from one plant to any other or several others. Its radius of action is limited only by the necessity for lift-truck or other equipment which will handle it.

Until a few months ago there were no recognized standards of dimension for either skid platforms or lift trucks, consequently every firm which wished to utilize this method of shipment to save money was obliged to negotiate individually with its consignees and arrange to have interchangeable equipment at both ends of the line haul. Many firms which could have saved large sums by shipping or receiving goods on skids, found themselves seriously handicapped by lack of interchangeability. Some six months ago the Bureau of Foreign and Domestic Commerce and the Bureau of Standards of the United States Department of Commerce, in cooperation with shippers, carriers, warehousemen, and manufacturers of equipment, held a series of conferences looking toward the establishment of national standards for this equipment, for the sole purpose of bringing about interchangeability in use and thereby removing the handicap of unnecessary diversity. This was merely the initial step in what is expected to be a continuing program in connection with this and other classes of materials-handling equipment.

Equipment Saves Costs

The establishment of such national standards of dimension as may be feasible will not only be of enormous benefit to shippers and carriers, but will have a tendency to reduce the cost of the equipment itself, since manufacturers will not be obliged to make or carry in stock so many different styles and sizes.

Materials-handling equipment of every kind, from wheel-barrows and hand trucks to huge cranes and power shovels, can be counted upon to save its full cost within a definite period of time, depending as to length

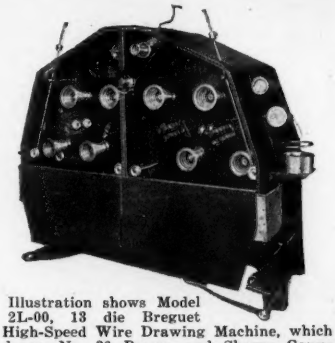

Illustration shows Model 2L-00, 13 die Breguet High-Speed Wire Drawing Machine, which draws No. 36 Brown and Sharpe Gauge and finer sizes of copper wire at a finishing speed of 4000 to 4500 feet per minute.

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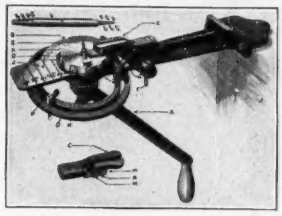

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(*Continued from page 65*)

upon the specific conditions of service, such as load factor and cost of previous methods of doing the same work. In the case of certain large and expensive machines, it may take a year, two years, even five years or more, to amortize the cost of the equipment by reduction in the unit cost of handling material. Invariably, however, each new development in equipment, particularly when it supersedes hand labor, pays for itself in a very short time. Furthermore, the amount of money spent for handling materials is so enormously larger than the cost of the necessary equipment that the users of such equipment are the ones who receive the largest benefits in dollars and cents.

Savings Are Net Gain

Today conditions in the field of handling finished goods and miscellaneous commodities in general are similar to conditions that existed forty years ago in the field of handling bulk materials. Disproportionately large savings are not only possible but are actually being made in specific instances. Power- and hand-lift trucks, tractors and trailers, many forms of "dead" and "live" skids, are saving their entire cost in a few months.

Savings due to labor- and time- saving equipment in many fields are sometimes partially offset by collateral losses, in changed methods, inconvenience, or some form of unavoidable waste. Handling materials is almost in a class by itself in this respect, in that savings made represent net gains, shared by all elements in industry. A fundamental economic principle has been concisely expressed in a form which might well become a slogan for the materials-handling industry; "Handling materials adds cost, but adds no value."

The problem of coordination and integration of the various methods, machines, and devices for materials handling is one of the most important that confronts engineers and executives today.

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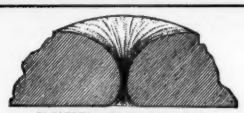
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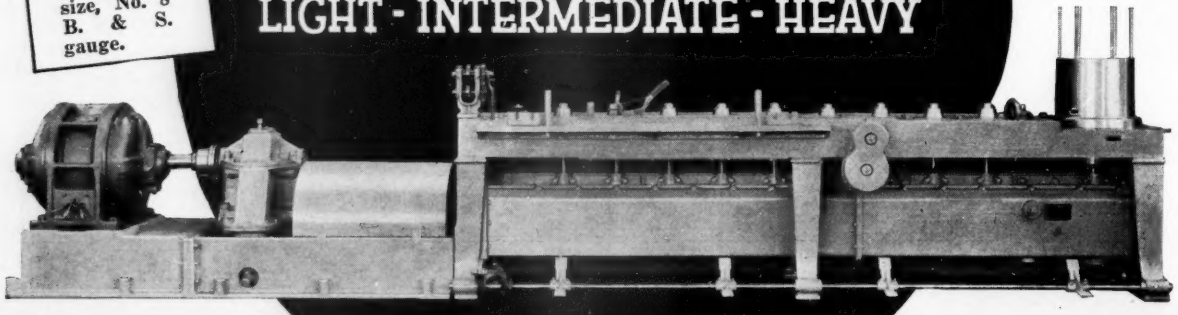

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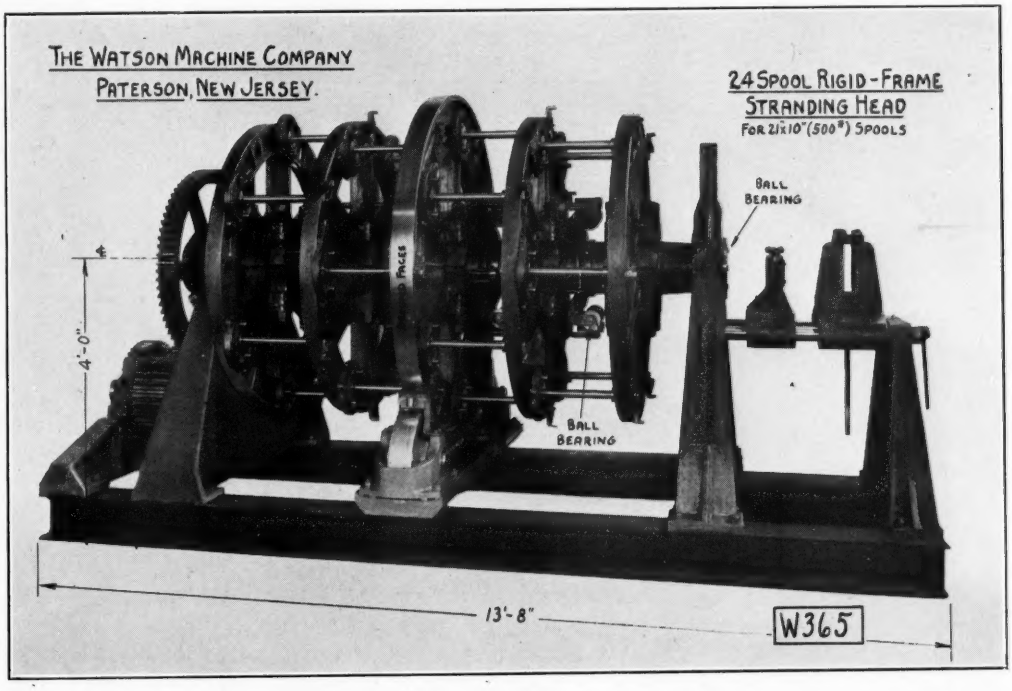

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